

# CELLULAR ORGANIZATION

## CELL → Discovery →

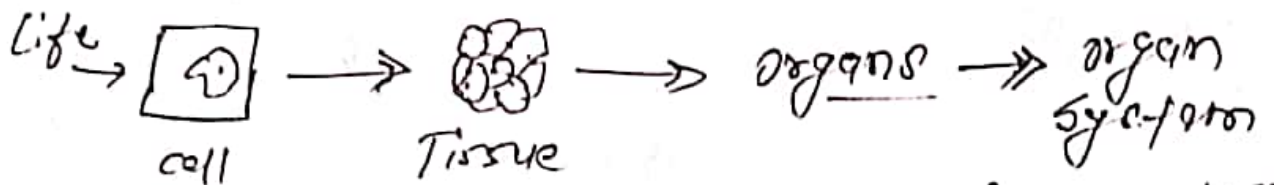
- Robert Hooke in 1665
- in cork
- cell comes from Latin from cella  
(small room)

1st living cell discovered by A.V. Leeuwenhoek  
He said motility is a feature which is seen in living cell..

## ① Evolution :-

- 3.5 billion year ago (living cell arose)
- chemoheterotrophs
- eukaryotic cell arose about 1.5 billion years ago

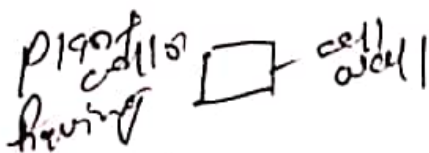
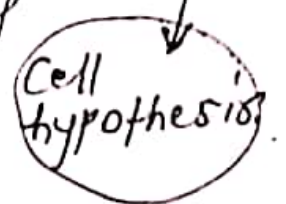
## ② Cell theory :- Cell is a basic unit of life..



Cell have a life

By Schleiden and Schwann (1839) → Animal cells → No cell wall.  
Cell theory given → Both animals & plants

Suggested - every structural part of plant made up of cells.



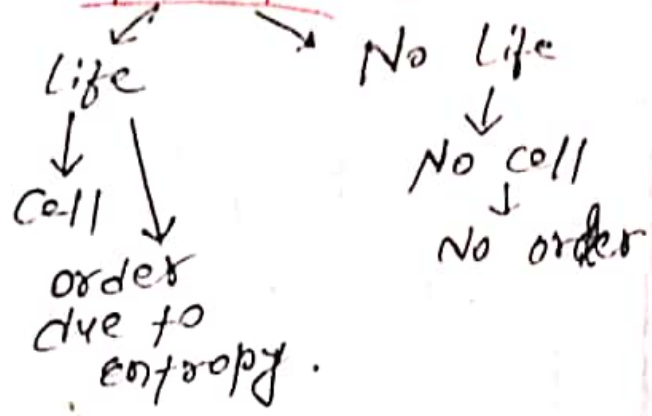
\* Five basic tenets of cell theory :-

1. All living organisms are composed of one or more cells or secretion of cells.
2. Cell is the most basic unit of life
3. omnis cellula e cellula (By Rudolf Virchow)  
(All cell arise from pre existing cells)
4. Cells contain hereditary material and are responsible for transfer of genes.
5. New cells are formed de novo from abiotic materials.

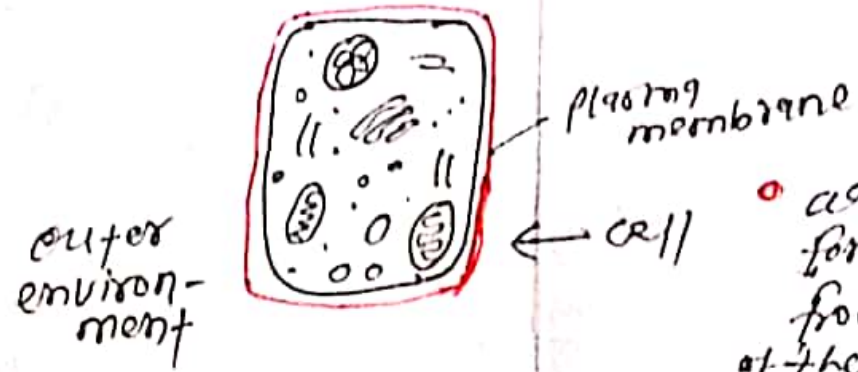
Exceptions:

Virus - lack protoplasm  
 Blue green algae, bacteria - Lack Nucleus.

\* Molecules :-

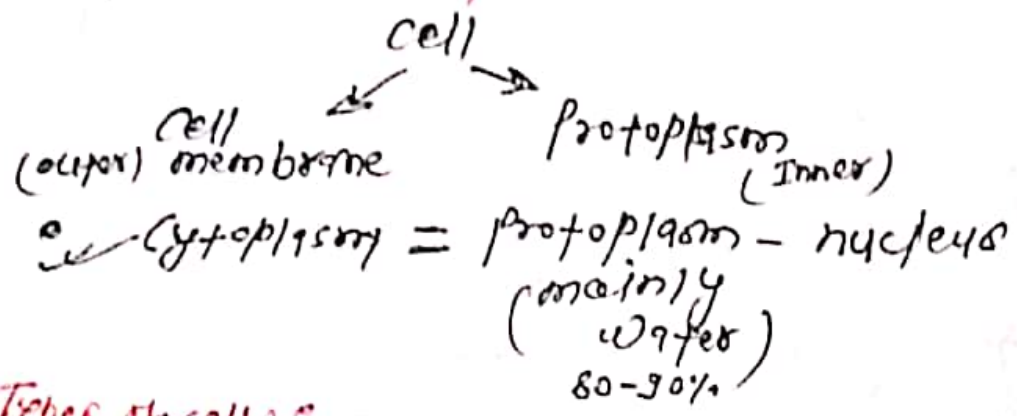


• what separates cell from outer universe?  
 plasma membrane / cell membrane

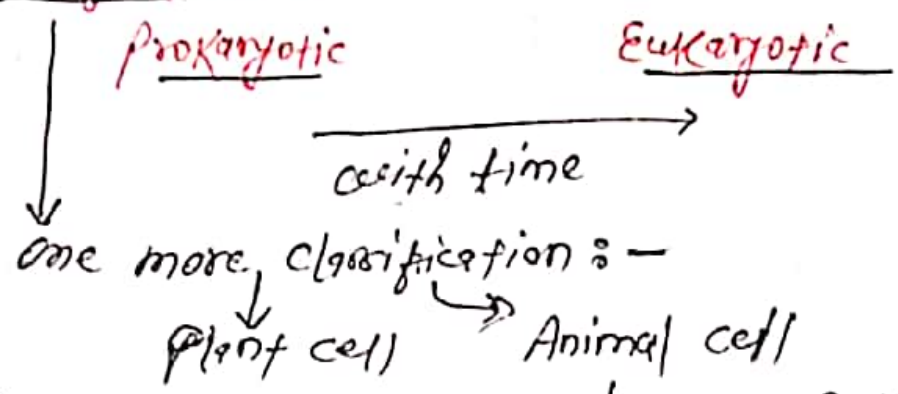


• what is the need for anything coming from outside to inside of the cell and vice versa.


• what is cell composed of ?



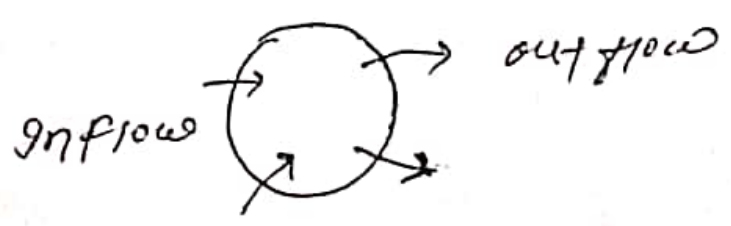
• Types of cells :-



- Prokaryotic cell  
 Pro → means Before
- Nuclear membrane absent
  - memb bound organelles absent
  - smaller ribosomes
  - size - 1-10  $\mu\text{m}$
  - Histone protein absent or, instead multiple other proteins present

- Eukaryotic cell  
 Eu = True
- Nucleus present
  - Present  present
  - Larger ribosome
  - 10-100  $\mu\text{m}$  size
  - Histone ~~protein~~ protein present

• Plasma Membrane :- → selectively permeability. It regulate inflow & outflow

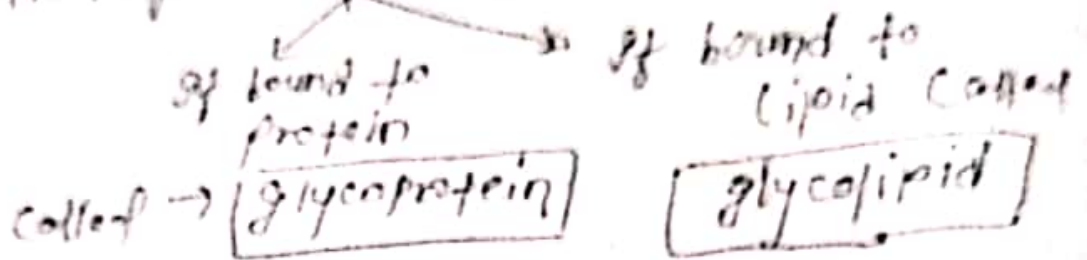


- protect the cell from outer environment or, separate it from outside.



# Membrane components formation:

- Protein + Lipid + Carbohydrate (5-10%)  
Ratio vary

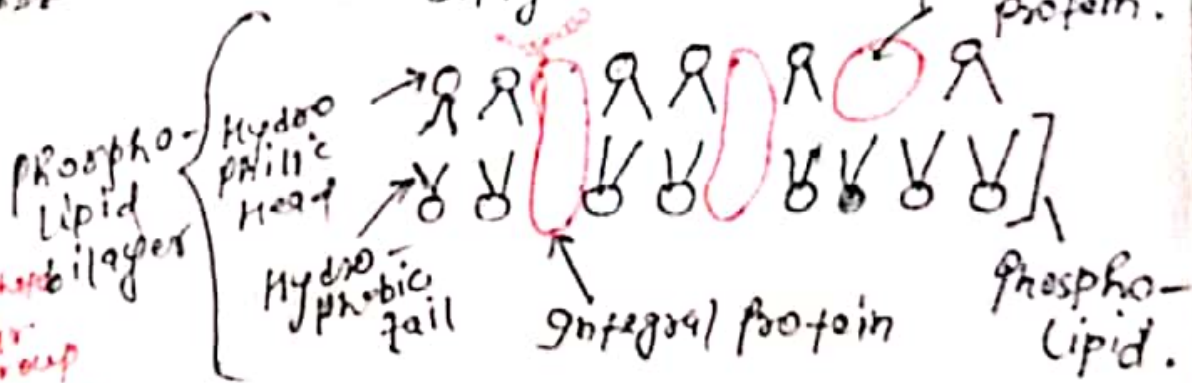
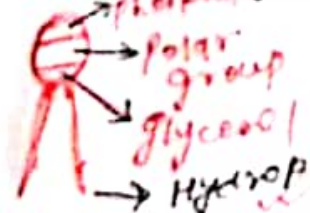
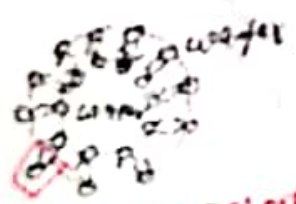
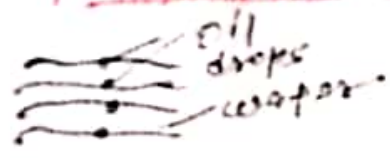


- PM is external boundary of cell
- Selectively permeable
- Dynamic in nature
- 1972 - Singer & Nicolson  
↓ given

## Fluid Mosaic Model

Membrane → quasi fluid str (mobile)  
Proteins inserted into lipid bilayer.

### Phospholipid bilayer



Forces that organise lipid bilayer → Hydrophobic interactions